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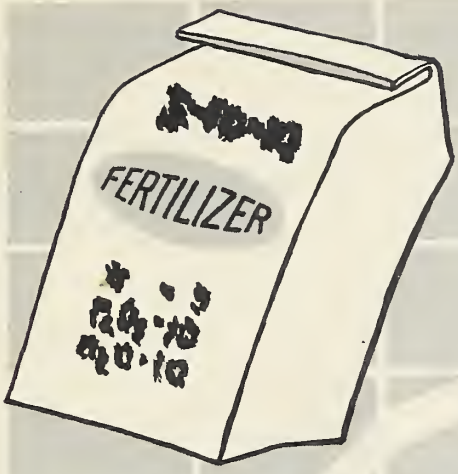

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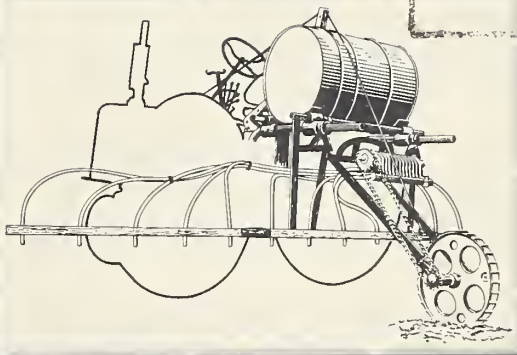

The FERTILIZER SITUATION for 1955-1956

Commodity Stabilization Service
United States Department of Agriculture

Washington, D.C. September 1955

PREFACE

The Fertilizer Situation for 1955-56 is the thirteenth in a series of annual reports on that subject issued by agencies within the U. S. Department of Agriculture.

This report was prepared by A. L. Mehring, fertilizer staff specialist, and Charlotte Graham, administrative assistant, Food and Materials Requirements Division, Commodity Stabilization Service.

Assistance of the Bureau of the Census, Department of Commerce; Bureau of Mines, Department of the Interior; Chemical and Rubber Division, Business and Defense Services Administration; and the Fertilizer and Agricultural Lime Section, Soil and Water Conservation Research Branch, Agricultural Research Service, is gratefully acknowledged.

The preliminary forecast of the 1955-56 fertilizer supply is combined with the usual report on deliveries of the three primary plant nutrients during the previous fiscal year.

It is intended that a supplemental report, showing any changes or developments, will be issued in the spring of 1956.

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THE FERTILIZER SITUATION FOR 1955-56

The 1955-56 Fertilizer Outlook

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On the basis of present information it is estimated that supplies of the three principal nutrients in 1955-56 will exceed the 1954-55 supply by about 2.5 percent. The estimate of larger supplies is based on existing rates of production and trends in usage and foreign trade rather than on capacity to produce fertilizer. Additional quantities of any one or all of the three nutrients can be produced should demand increase.

The available supply of plant nutrients has increased each year since the 1938-39 season, and the trend continues upward. Deliveries of nutrients to the fertilizer manufacturing industry during the 1954-55 season totaled 6.427 million tons, as compared with 6.215 million tons in 1953-54, or an increase of 3.4 percent.

Nitrogen (N):

It is currently estimated that the 1955-56 supply of nitrogen available for fertilizer use will approximate 2.35 million tons. This preliminary estimate, based on current rate of production and trends in usage and foreign trade, represents an increase of 4.4 percent over the 2.25 million tons reported for 1954-55.

Details of the 1954-55 deliveries and the estimated 1955-56 supply of nitrogen by type and class are shown in tables 1 and 1A.

Four companies sold urea for agricultural use in substantial amounts during the past season and therefore the nitrogen content is entered separately in the tables for the first time.

Losses in the net supply of nitrogen for agriculture occur in distribution and handling, the ammoniation of superphosphate, sales for small-scale industrial uses, and the consumption of ammonia in the manufacture of sulfuric acid in fertilizer plants. These come out of the shipments from primary producers to the fertilizer trade. Normally these losses amount to 2 to 3 percent.

Quantities of nitrogen that constitute the normal working stock in the hands of fertilizer manufacturers and ammonia distributors are not known precisely, but reports from the industry indicate that stocks are definitely larger than a year ago. New storage capacity, especially in the form of ammonia tanks, has contributed to this increase.

Phosphates (P_2O_5):

The 1955-56 supply of available phosphoric oxide is forecast at 2.3 million tons, or approximately the same quantity delivered in 1954-55.

This estimate is based on production, trends in consumption and foreign trade in recent years. Much larger supplies can be produced in 1955-56, provided the extra demand does not occur during the spring rush.

Details of the 1954-55 deliveries and the 1955-56 supply by type and class of material are shown in tables 2 and 2A.

Quantities of available P_2O_5 produced are always substantially more than the amounts delivered to farmers. An average of about 2 percent of the available P_2O_5 is reverted to an unavailable form in liming superphosphate for sale in bags. It has been estimated that an average of around 4 percent of the available P_2O_5 in run-of-pile goods used in making mixed fertilizers is also lost, mostly due to ammoniation.

Potash (K_2O):

The 1955-56 supply of potash available for fertilizer in terms of potassium oxide (K_2O) is estimated at 1.94 million tons. This represents an increase of approximately 4.3 percent over the 1.86 million tons available in 1954-55. This forecast is based on trends in production, use, and foreign trade rather than the capacity of the industry to produce. Details of the 1954-55 deliveries and the 1955-56 forecast are given in tables 3 and 3A.

General

Seasonal Demand

Heavy buying of fertilizer immediately prior to application adds to the expense of manufacture, complicates transportation and delivery, and occasionally results in temporary shortages that disrupt growers' planting schedules. Delivery some time in advance of actual application, although advantageous to the manufacturer, as a rule makes some extra handling for the grower. However, the present trend is toward buying close to the time of application.

Fertilizer demand in 1941 rose to a peak of 27 percent of the year's total usage in the single month of March, as judged by tax tag sales. Another 28 percent of the year's total was taken in April. Thus more than half of the total for the year apparently was bought in two months. This is typical of pre-World War II practice. From 1942 to 1948 more farmers bought fertilizer in advance of need because of shortages of nitrogen and potash. Since 1948 monthly purchases of tax tags indicate a growing tendency to return to the earlier buying practice.

Experiments have shown that application of fertilizer in late fall for certain spring-planted crops is practical in some areas, especially in the North Central States. This would save time during the spring rush. However, fall application of nitrogen is not generally practical where the soil warms up during the winter.

Prices

Wholesale prices of most nitrogenous fertilizers are slightly lower than they were a year ago, but phosphate and potash prices are about the same. The wholesale price of urea dropped substantially during the past year.

The average retail price of all mixed fertilizers sold in the United States in the 1953-54 season, as published in the September 15, 1954 issue of "Agricultural Prices," weighted by the tonnage of each grade sold, as reported by the Soil and Water Conservation Research Branch, is $54.82 per ton. Similar weighted averages of chemical nitrogenous materials, natural organics, phosphates, and potash materials sold separately are $88.26, $54.12, $40.49 and $54.25 respectively. In the 1954-55 season retail prices of mixed fertilizers and potash materials averaged about $1 per ton less, of nitrogenous materials about $2 per ton less, and of phosphates, no change.

Status of Nitrogen Expansion

Details of the nitrogen production capacity of the country, by regions, for the years 1954 through 1957 and consumption figures for the years ended June 30, 1953 and 1954 are given in table 4. Proposed plants with a combined capacity of 220,000 tons of nitrogen have been left out of the 1957 total because of some doubt that they will be built.

Estimates of Canadian nitrogen production capacity are included in table 4 due to the fact that a large part of the Canadian production in the past has been used in the United States, and because capacity is being expanded in Canada also. If announced plans are carried out Canadian capacity will increase from around 300,000 tons on July 1, 1954 to about 500,000 tons of nitrogen in 1957.

Prior to 1942 consumption of nitrogen as fertilizer in the United States never exceeded a half-million tons. As shown by the graph, page 13, usage has increased rapidly since then.

Although every synthetic ammonia plant in the United States was operating at near capacity in 1951, with the exception of Morgantown Ordnance Works, demand for nitrogen was met only because of decreased exports and increased imports. The manner in which the import-export balance suddenly changed from 1950 to 1951 is shown in table 5. This trend continued until 1953, but has now swung in the other direction. In 1952 about 95 percent of total capacity was fully utilized to produce nitrogenous materials. In the 1954-55 fiscal year the rate of production had dropped to about 82 percent of capacity.

If demand for nitrogen should continue to grow at the rate it has in recent years, agriculture would require about 3,000,000 tons in 1959-60.

It appears now that agricultural consumption in 1954-55 approximated 2 million tons of nitrogen. Should requirements continue to increase 10 percent per year, as they did for a number of years, ample production

capacity will be available in North America by July 1, 1956 to take care of this and all other normal needs of this continent for the next few years.

Status of Phosphorus Expansion

Because the heaviest demand for superphosphates occurs during a brief period prior to application, the lack of suitable storage space limits the operation of producing plants the rest of the year. This situation affects the estimation of plant capacity. However, it can be stated that production capacities have increased from January 1, 1952 to July 1, 1955 as follows: normal superphosphate 4 percent, concentrated superphosphate 187 percent, and miscellaneous phosphates 52 percent.

Miscellaneous phosphates include basic slag, ammonium phosphates, nitraphosphates, fertilizer-grade bone meal and a number of other materials of lesser importance.

During the coming year about 250,000 tons of additional P_2O_5 capacity is expected to come into production. A considerable part of this will be in the form of ammonium phosphates.

Status of Potash Expansion

Estimated production capacity of refined salts was 1,400,000 tons of K_2O on January 1, 1951. Capacity on July 1, 1955 was estimated to be 2,100,000 tons. Plans to erect 400,000 tons of additional K_2O capacity have been announced for early completion. Facilities to produce 40,000 tons of additional potassium sulfate came into use during the past spring.

Most of the large potash producers have acquired rights to mine potash in the Province of Saskatchewan, Canada. One company is sinking a shaft to the potash beds. Commercially exploitable potash beds are reported to have been found in Grand Canyon, Utah.

Miscellaneous Developments

The use of fertilizer-insecticide mixtures in agriculture increased from 10,000 tons in 1950-51 to 87,000 in 1952-53, 149,000 in 1953-54 and around 200,000 tons in 1954-55.

Use of liquid fertilizers for most purposes has been handicapped by lack of an inexpensive implement that would make satisfactory application. An improved hose-pump distributor attachment for tractor or other machinery has been developed for this purpose in cooperation with the Department of Agriculture. Commercial manufacture of this attachment began during the past year.

Table 1. -- NITROGEN: 1954-55 Supply for Fertilizer Purposes
United States and possessions (trade delivery basis)1/

(In tons of 2,000 pounds nitrogen content)

Item	Ammonium Nitrate 2/	Ammonium Sulfate & Sulfate-nitrate	Urea	Other Solids 3/	Natural Organics	Compound solutions: Ammoniation	Compound solutions: Direct Application	Ammonia 4/: Ammoniation	Ammonia 4/: Direct Application	Totals
U. S. Deliveries										
Synthetic	408,000	181,000	38,000	90,000	--	453,000	35,000	170,000	414,000	1,789,000
By-product	--	5/176,000	--	--	--	--	--	2,000	300	178,300
Natural organics	--	--	--	--	30,000	--	--	--	--	30,000
Total	408,000	357,000	38,000	90,000	30,000	453,000	35,000	172,000	414,300	1,997,300
Exports 6/	11,000	90,000	4,000	12,000	1,000	30,000	--	7,000	--	155,000
Deliveries minus exports	397,000	267,000	34,000	78,000	29,000	423,000	35,000	165,000	414,300	1,842,300
Imports 6/	133,000	57,000	34,000	174,000	7,000	--	--	3,000	--	408,000
Net supply	530,000	324,000	68,000	252,000	36,000	423,000	35,000	168,000	414,300	2,250,300

1/ Based upon special reports from synthetic ammonia producers and other sources; Bureau of Mines' Monthly Coke Reports, and Bureau of the Census' Facts for Industry and import and export reports.
2/ Includes mixtures of ammonium nitrate and limestone.
3/ Includes ammonium phosphates, sodium nitrate, calcium nitrate, cyanamid, and nitraphosphates.
4/ Includes aqua ammonia.
5/ Includes nitrogen content of ammonium phosphate made from by-product ammonia.
6/ Includes estimated nitrogen content of imported and exported mixed fertilizers and ammoniated superphosphate.

Table 1A. -- NITROGEN: Estimated 1955-56 Fertilizer Supply 1/
United States and possessions

(In tons of 2,000 pounds nitrogen content)

Item	Ammonium Nitrate 2/	Ammonium Sulfate & Sulfate-nitrate	Urea	Other Solids 3/	Natural Organics	Compound solutions 4/: For mixing	Compound solutions 4/: Direct Application	Ammonia 5/: For mixing	Ammonia 5/: Direct Application	Totals
U. S. Production										
Synthetic	420,000	220,000	50,000	100,000	--	470,000	50,000	180,000	460,000	1,950,000
By-product	--	6/185,000	--	--	--	--	--	2,000	--	187,000
Natural organics	--	--	--	--	30,000	--	--	--	--	30,000
Total	420,000	405,000	50,000	100,000	30,000	470,000	50,000	182,000	460,000	2,167,000
Exports 7/	15,000	110,000	5,000	20,000	1,000	40,000	--	7,000	--	198,000
Supply from domestic sources	405,000	295,000	45,000	80,000	29,000	430,000	50,000	175,000	460,000	1,969,000
Imports 7/	120,000	50,000	30,000	170,000	6,000	--	--	5,000	--	381,000
Net supply	525,000	345,000	75,000	250,000	35,000	430,000	50,000	180,000	460,000	2,350,000

1/ Based on present rates of production, imports and exports and trends in the trade.
2/ Includes mixtures with limestone.
3/ Ammonium phosphates, sodium nitrate, calcium nitrate, cyanamid and nitraphosphates.
4/ Includes ammonia-ammonium nitrate, ammonium nitrate and ammonia-urea solutions in water.
5/ Includes aqua ammonia.
6/ Includes by-product ammonium phosphate.
7/ Includes estimated nitrogen content of imported and exported mixed fertilizers and ammoniated superphosphate.

Table 2. -- PHOSPHORUS: 1954-55 Supply for Fertilizer Purposes
United States and Possessions (trade delivery basis)

(In tons of 2,000 pounds available phosphoric oxide (P_2O_5))

Item	Normal superphosphate 1/	Enriched superphosphate	Concentrated superphosphate	All others 2/	Total
U. S. Production	1,572,000	41,000	619,000	179,000	2,411,000
Exports 3/	80,000	--	59,000	30,000	169,000
Supply from U. S. sources	1,492,000	41,000	560,000	149,000	2,242,000
Imports 3/	2,000	--	1,000	67,000	70,000
Net supply	1,494,000	41,000	561,000	216,000	2,312,000

1/ Includes wet-mixed base goods.
2/ Includes ammonium phosphates, basic slag, fused rock phosphate, liquid phosphoric acid, and natural organics, and 2% of colloidal phosphate and 3% of rock phosphate applied directly to soil.
3/ Includes the available P_2O_5 content of mixed fertilizers.

Table 2A. -- PHOSPHORUS: Estimated 1955-56 Supply for Fertilizer Purposes
United States and Possessions

(In tons of 2,000 pounds available phosphoric oxide (P_2O_5))

Item	Normal superphosphate 1/	Enriched superphosphate	Concentrated superphosphate	All others 2/	Total
U. S. Production	1,550,000	45,000	650,000	200,000	2,445,000
Exports 3/	100,000	--	70,000	40,000	210,000
Supply from domestic sources	1,450,000	45,000	580,000	160,000	2,235,000
Imports 3/	2,000	--	1,000	62,000	65,000
Total supply	1,452,000	45,000	581,000	222,000	2,300,000

1/ Includes wet-mixed base goods.
2/ Includes ammonium phosphate, basic slag, fused rock phosphate, liquid phosphoric acid, dicalcium phosphate, high-grade residue, natural organics and other sources of available P_2O_5.
3/ Includes the P_2O_5 content of mixed fertilizers and ammoniated superphosphate.

Table 3. -- POTASSIUM: 1954-55 Supply for Fertilizer Purposes
United States and Possessions (trade delivery basis)

(In tons of 2,000 pounds of potassium oxide (K_2O))

Item	Potassium chloride 1/	Potassium sulfate and sulfate of potash-magnesia 1/	Manure salts 1/	All other materials 2/	Total
Deliveries from domestic sources	1,687,000	107,000	1,000	26,000	1,821,000
Exports 3/	86,000	10,000	--	1,000	97,000
Deliveries minus exports	1,601,000	97,000	1,000	25,000	1,724,000
Imports 3/	104,000	30,000	--	7,000	141,000
Net supply for agriculture	1,705,000	127,000	1,000	32,000	1,865,000

1/ Deliveries as reported by producers.
2/ Includes potash content of imported potassium nitrate, of natural organics, such as tobacco stems, and of miscellaneous fertilizers, such as cement flue dust. Some small-scale sales of muriate (chloride) are included here since they are not included in the muriate data published elsewhere.
3/ Includes the potash content of mixed fertilizers.

Table 3A. -- POTASSIUM: Estimated 1955-56 Supply[1/] for Fertilizer Purposes
United States and Possessions

(In tons of 2,000 pounds of potassium oxide (K_2O))

Item	Potassium chloride	Potassium sulfate and sulfate of potash-magnesia	Manure salts	All other materials 2/	Total
Domestic production	1,780,000	140,000	1,000	26,000	1,947,000
Exports 3/	130,000	15,000	--	1,000	146,000
Supply from domestic sources	1,650,000	125,000	1,000	25,000	1,801,000
Imports 3/	100,000	30,000	--	8,000	138,000
Total supply	1,750,000	155,000	1,000	33,000	1,939,000

1/ Based on consumption trends and prospective demand rather than on capacity of the industry to produce.
2/ Includes potassium nitrate, potassium carbonate, cement-flue dust, nitrate of soda-potash and natural organics.
3/ Includes potash content of mixed fertilizers.

Table 4. -- NITROGEN: Production capacity and consumption as fertilizer

(1,000 tons -- 2,000 pounds each -- of nitrogen content)

Region	Production capacity 1/ as of July 1				Fertilizer consumption 2/ year ended June 30	
	1954	1955	1956	1957	1953	1954
Eastern 3/	791	898	1,062	1,097	492	518
East North Central 4/	380	472	652	653	239	261
West North Central 5/	188	301	359	452	180	266
East South Central 6/	250	372	408	500	256	263
West South Central 7/	789	949	949	950	151	182
Western 8/	210	297	485	680	266	299
Territories 9/	1	1	1	35	53	58
Total United States	2,609	3,290	3,916	4,367	1,637	1,847
Eastern Canada 10/	139	162	204	290	29	30
Western Canada 11/	167	177	190	219	15	12
GRAND TOTAL	2,915	3,629	4,310	4,876	1,681	1,889

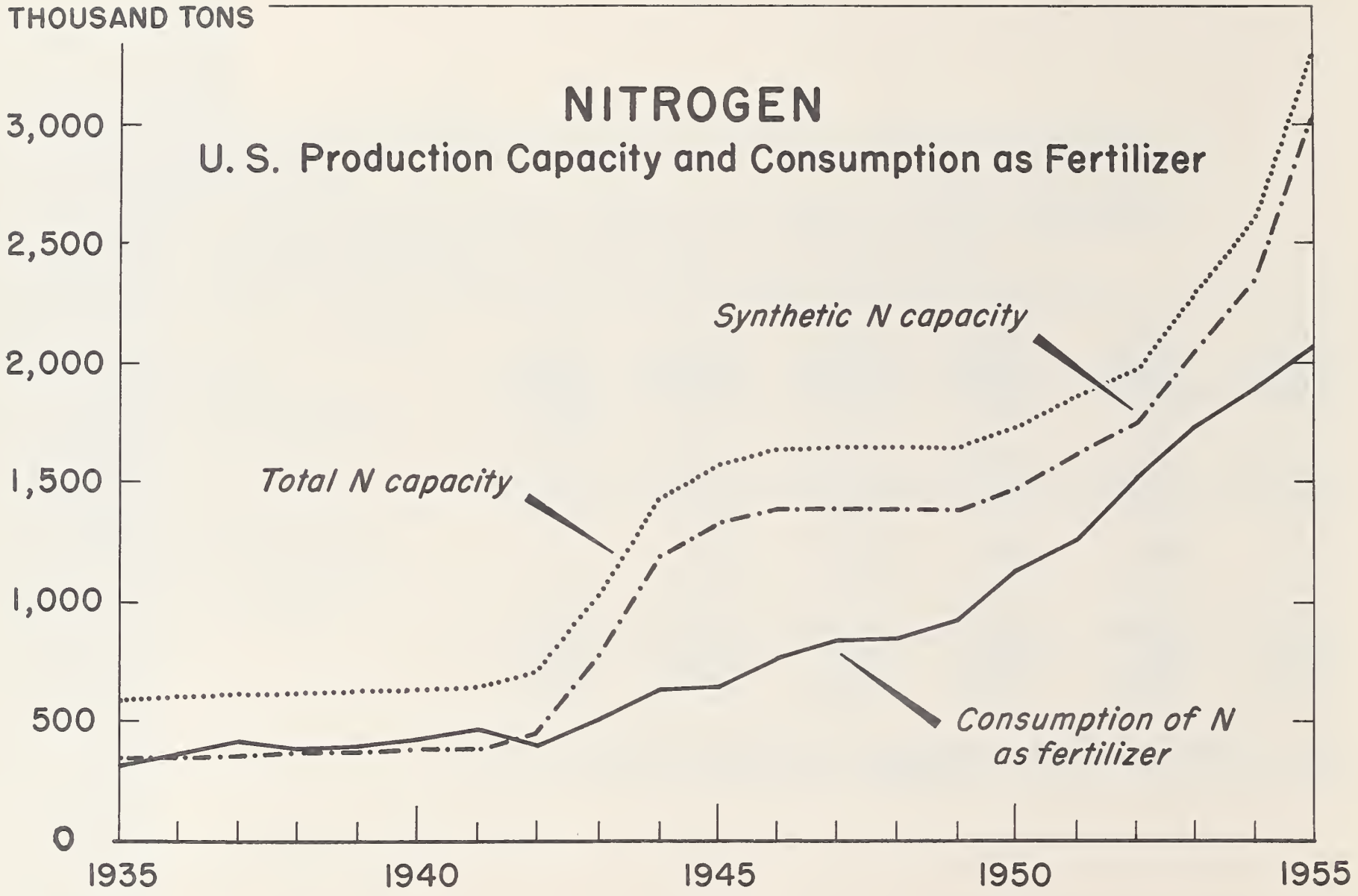
1/ Estimated total of synthetic, chemical by-product and natural organic nitrogen.
2/ U. S. figures from data compiled by the Soil and Water Conservation Research Branch, Department of Agriculture; those for Canada from Dominion Bureau of Statistics.
3/ New England, Middle Atlantic and South Atlantic States.
4/ Ohio to Wisconsin inclusive.
5/ North Dakota and Minnesota to Kansas and Missouri inclusive.
6/ Kentucky and Alabama to Mississippi inclusive.
7/ Oklahoma, Arkansas, Louisiana and Texas.
8/ Montana and New Mexico to Washington and California inclusive.
9/ Alaska, Hawaii and Puerto Rico.
10/ Newfoundland to Ontario inclusive.
11/ Manitoba to British Columbia inclusive.

Table 5. -- U. S. Nitrogen Balance Sheet

(In tons of 2,000 pounds nitrogen content)

Item	Year ended					
	Dec. 30, 1950	Dec. 30, 1951	Dec. 30, 1952	Dec. 30, 1953	June 30, 1954	June 30, 1955
Production:						
Synthetic 1/	1,288,463	1,453,711	1,688,069	1,882,847	2,074,882	2,481,436
By-product 2/	192,099	207,313	184,286	216,298	202,141	201,012
Natural organic 3/	38,000	37,000	36,000	35,000	35,000	30,000
Total	1,518,562	1,698,024	1,908,355	2,134,145	2,312,023	2,712,448
Conversion loss (5% of synthetic production)	64,423	72,686	84,403	94,142	103,744	124,072
Deduction for increase in stocks at producing plants during the season 4/	--	6,278	16,319	43,274	13,802	55,170
Exports (industrial and fertilizer) and re-exports	245,382	79,461	69,022	44,478	87,000	196,000
Domestic current supply apparently consumed	1,208,757	1,539,599	1,738,611	1,952,251	2,107,477	2,337,206
Addition for decrease in stocks at producing plants during the season 4/	4,157	--	--	--	--	--
Imports (industrial and fertilizer)	276,697	357,110	471,142	501,151	438,000	419,000
Total apparent consumption	1,489,611	1,896,709	2,209,753	2,453,402	2,545,477	2,756,206
Consumption as fertilizer	1,126,000	1,265,900	1,505,000	1,709,000	1,847,416	2,000,000
Apparent consumption for all other uses 5/	363,611	630,809	704,753	744,402	698,061	756,206

1/ Computed from anhydrous ammonia production reported by U. S. Bureau of the Census' Facts for Industry.
2/ Computed from ammonium sulfate and aqua ammonia production reported by U. S. Bureau of Mines.
3/ Estimated quantity available for fertilizer.
4/ Stocks of anhydrous ammonia, synthetic and by-product ammonium sulfate, by-product aqua ammonia, nitric acid and ammonium nitrate. (Partly from U. S. Bureau of the Census' Facts for Industry and Inorganic Chemicals and partly from unpublished data.
5/ This figure is merely the difference between the two numbers above it. Although of the correct order of magnitude, it is less accurate than the other data because stock-buildup in the hands of industrial users, fertilizer mixers and distributors is not evaluated.


THOUSAND TONS
NITROGEN
U. S. Production Capacity and Consumption as Fertilizer
3,000
2,500
2,000
1,500
1,000
500
0
Synthetic N capacity
Total N capacity
Consumption of N as fertilizer
1935
1940
1945
1950
1955